

## WHAT IS CLAIMED IS:

1. A real-time infrared chemical imaging spectroscopic apparatus,  
in cooperation with a target, comprising:

a light source for emitting infrared radiation;

5 a first focusing lens for receiving and focusing said infrared  
radiation;

a monochromator for receiving and dispersing said infrared  
radiation being converged by means of said first focusing lens to form a  
narrow-bandwidth infrared radiation having a predetermined wavelength;

10 a second focusing lens for receiving and transforming said  
narrow bandwidth infrared radiation into collimated narrow-bandwidth  
infrared radiation;

a sample stage for receiving said collimated narrow-bandwidth  
infrared radiation so that said collimated narrow-bandwidth infrared  
15 radiation pass through a target mounted on said sample stage; wherein said  
target absorbs said collimated narrow-bandwidth infrared radiation and  
emits thermal radiation;

a Cassegrain objective for collecting said thermal radiation; and

20 an IR camera for receiving said thermal radiation collected by  
said Cassegrain objective to form an image.

2. The real-time infrared chemical imaging spectroscopic apparatus  
of claim 1, wherein the wavelength of the maximum intensity peak of said  
infrared radiation is in the mid-infrared range.

3. The real-time infrared chemical imaging spectroscopic apparatus

of claim 1, wherein said wavelength of infrared radiation with in the range of 2.5 — 25  $\mu\text{m}$ .

4. The real-time infrared chemical imaging spectroscopic apparatus of claim 1, wherein said first focusing lens is a cylindrical lens.

5           5. The real-time infrared chemical imaging spectroscopic apparatus of claim 1, wherein said second focusing lens is a spherical lens.

6. The real-time infrared chemical imaging spectroscopic apparatus of claim 1, wherein said monochromator is equipped with an optical grating to disperse said infrared radiation and select a narrow-bandwidth infrared  
10 radiation with a predetermined wavelength.

7. The real-time infrared chemical imaging spectroscopic apparatus of claim 1, wherein said IR camera is an infrared imaging detector.

8. The real-time infrared chemical imaging spectroscopic apparatus of claim 7, wherein said infrared imaging detector is equipped with an  
15 infrared focal plane array.

9. The real-time infrared chemical imaging spectroscopic apparatus of claim 1, further comprising a parabolic mirror disposed between said light source and said first focusing lens to collimate said infrared radiation irradiated from said light source to be incident on said first focusing lens.

20           10. The real-time infrared chemical imaging spectroscopic apparatus of claim 1, further comprising a monitor connected to said IR camera to display said image.